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(54) INTERNET MULTICAST CHANNEL SALES SERVICE SYSTEM AND METHOD FOR SAME

(57) Abstract

1. Technical field of the invention disclosed in the claims
The present invention relates to an internet multicast channel sales service system and method for same

2. Technical problem to be solved by the invention
The present invention seeks to provide an internet multicast channel sales system and method for same, whereby the currently problematically complex procedures and server configuration problems of overcharging, channel management, and illegal use can be addressed through the construction of a channel sales service for multicast broadcasting, so that internet service providers (ISPs) can create new added value, and a recording medium that can be read by a computer wherein a program for implementation of said method has been recorded.

3. Summary of the solution of the invention
The present invention comprises an electronic program provision means for the provision of a list of channels being sold and broadcast times to the multicaster and a program of channels and broadcast times to the multicast listener; a channel sales means for the sale of channels and broadcast times to said multicaster and the management of channels that have been sold; a payment processing means for the processing of payments for channel sales in said channel sales means; a license management means for the management of licenses assigned to the channels sold to said multicaster; an automatic program transmission means for the transmission of relevant channel data to a multicast network and management of the broadcast program; a channel management means for generating, deleting, editing and monitoring channels in a multicast network by connection to said electronic program provision means and said automatic program transmission means; a storage means for storing the files provided by said multicaster; and a statistical means for reporting and managing broadcast statistical information to/for said multicaster after completion of listening by said multicast listener.

4. Important applications of the invention
The present invention is used in internet broadcast systems.

Representative diagram

Figure 2

Keywords

Internet, multicast, broadcast, channel, sales, electronic program, stream, channel management

Specification

Brief description of the drawings

Figure 1 is an example configuration diagram of a multicast service system of the prior art.

Figure 2 is a configuration diagram of one embodiment of the internet multicast channel sales service system of the present invention.

Figure 3 is a detailed configuration diagram of one embodiment of the internet multicast channel sales service system of the present invention.

Figure 4 is a detailed configuration diagram of one embodiment of the channel sales system of said Figure 2.

Figure 5 is a detailed configuration diagram of one embodiment of the automatic program transmission system of said Figure 2.

Figure 6 is an illustration of one embodiment of the channel information of the channel information server of the present invention.

Figure 7 is a flow chart of an embodiment of the process of actuation of the stream (or channel) posting server of the present invention.

Figure 8 is an explanatory diagram showing one embodiment of the information that must be entered in order to post a file to the stream (or channel) posting server.

Figure 9 is an explanatory diagram showing one embodiment of the electronic program guide of the present invention.

Figure 10 is a flow chart of one embodiment of the process of actuation of the electronic program guide of said Figure 9.

Figure 11 is an explanatory diagram of an embodiment of the network configuration for the internet multicast channel sales service of the present invention.

Figure 12 is a detailed explanatory diagram of an embodiment of the network configuration for the internet multicast channel sales service of the present invention.

Figure 13 is a detailed explanatory diagram of an embodiment of another network configuration for the internet multicast channel sales service of the present invention.

Figure 14 is a flow chart of one embodiment of the internet multicast channel sales service method of the present invention.

* Key to the drawings

210 : Multicaster
220 : Multicast channel sales service system
221 : Channel sales system
222 : Electronic transaction system
223 : Storage system
224 : Digital license management system
225 : Statistical system
226 : Electronic program guide
227 : Automatic program transmission system
228 : Channel management system
230 : Multicast network
240 : Multicast listener

Detailed description

Objective of the invention

Technology to which the invention belongs and prior art of the field

The present invention relates to an internet multicast channel sales service system and method for same, for the purpose of the creation, management, and internet-based sale of multicast broadcast channels, and to a computer-readable recording medium on which is recorded a program for implementing said method.

Just as ordinary broadcasts are broadcast via electromagnetic waves or cable TV networks, they can also be broadcast via data streams on the internet. In other words, just as ordinary broadcasts can transmit to all recipients wishing to receive a broadcast with a single electromagnetic transmission, by multicast technology it is possible to optionally transmit to all recipients wishing to receive the broadcast by a single data stream on the internet.

To explain this in somewhat greater detail, information is sent to specific multiple people by a bucket-relay technique, transmitting the same content to several recipients by one person sending information to several people among the users who are connected to the Internet or to a local area network (LAN). Specifically, unlike unicast that transmits to one specific individual, and broadcast that transmits information to unspecified multiple people, multicast technology transmits information only to specified multiple terminals.

Accordingly, using a multicast apparatus to which multicast technology has been applied, internet service providers can convert their own networks into multicast networks.

In addition, if said multicast technology is commercialized, it can be divided into several channels for multiple users wishing to receive data such as high-quality video, audio stream, and data stream at the same time. Several multicast channels are created, so to speak, on the internet, and the user can receive a desired broadcast or data from among these several channels just as if watching TV or by radio.

However, multicast technology is impossible under existing internet protocols, which do not support multicasting. This results from the fact that since as many separate data streams must be sent as there are users, a burden is created on the network and this makes it impossible to transmit multiple high-quality broadcasts at the same time. In other words, even if only one broadcast is transmitted, data in a number equal to the number of users must be simultaneously sent, and thus the number of users or data streams that can be supported by the network capacity and server capacity is limited.

In other words, in a network applying a multicast protocol, it is possible to broadcast based on network capacity regardless of the number of users. For example, on a cable TV network, the capacity is 30 Mbps and therefore it is possible to transmit 30 broadcasts at 1 Mbps, or 60 broadcasts at 500 kbps.

Figure 1 is an example configuration diagram of a multicast service system of the prior art.

In the diagram, "110" represents a multicaster, "111" a camera, "112" a video, "113" a media conversion and encryption server, "114" an electronic transaction server, "115" a streaming server, "116" a digital license server, "120" a router, "130" a multicast network, and "140" a multicast viewer.

In order for a multicaster (110) who is an individual or internet broadcasting business wishing to broadcast by multicast to do so currently, first he registers and obtains permission for the multicast service from the internet service provider (ISP) providing the multicast network (130), and if the ISP grants permission for multicast using the router (120), the multicaster (110) installs software for multicast broadcasting on his own computer or server, and multicasts using a digital file or an AV input such as the camera input (111) or video (112) etc.

In addition, in order for the multicaster (110) to profit from this, the multicast stream must be encrypted so that only authenticated multicast viewers (140) can view the broadcast. To this end, the multicaster (110) requires a media conversion and encryption server (113) for converting and encrypting media; a digital license server (116) for managing licenses, an electronic transactions server (114) for broadcast business, and a streaming server (115) for real-time playback of sound, video, animation, etc. via the internet.

Multicast systems of the prior art have had the following several problems from the perspective of individuals and internet broadcasters.

First, even if an individual or internet broadcaster is already using the internet network of another ISP, in order to perform multicast broadcasting, it is necessary to connect to an ISP having a multicast network, and after the connection is made, the ISP's permission for multicast use must be obtained. This process takes a problematic amount of time.

Second, setup is necessary in order to use multicasting, which is complex, on one's own computer or PC. Also, setup is necessary so that one's own router or local network can handle multicasting, and if the apparatus on hand does not support multicasting, it is necessary to install a new apparatus that does; this is problematic.

Third, in order to obtain revenue from multicasted streams, it is necessary to have a large number of apparatuses such as a digital license server for stream encryption, an electronic transaction server for payment processing, etc.; this is problematic.

In addition, there have been the following several problems from the perspective of the ISP providing the multicast network.

First, the multicast is required to generate a stream from several places within the ISP network, creating a problematic burden on the network and reduction in service quality due to the collision of multicast groups and stream management.

Second, although multicasting can create new added value as an important network service, there has been no solution for effective billing.

Technical task of the invention

The present invention, having been devised in order to solve the above-described problems, has the objective of providing an internet multicast channel sales system and method for same, whereby the currently problematically complex procedures and server configuration problems of overcharging, channel management, and illegal use can be addressed through the construction of a channel sales service for multicast broadcasting, so that internet service providers (ISPs) can create new added value, and a recording medium that can be read by a computer wherein a program for implementation of said method has been recorded.

Configuration of the invention

The apparatus of the present invention, which is intended to achieve the above objective, comprises an electronic program provision means for the provision of a list of channels being sold and broadcast times to the multicaster and a program of channels and broadcast times to the multicast listener; a channel sales means for the sale of channels and broadcast times to said multicaster and the management of channels that have been sold; a payment processing means for the processing of payments for channel sales in said channel sales means; a license management means for the management of licenses assigned to the channels sold to said

multicaster; an automatic program transmission means for the transmission of relevant channel data to a multicast network and management of the broadcast program; a channel management means for generating, deleting, editing and monitoring channels in a multicast network by connection to said electronic program provision means and said automatic program transmission means; a storage means for storing the files provided by said multicaster; and a statistical means for reporting and managing broadcast statistical information to/for said multicaster after completion of listening by said multicast listener.

In addition, the method of the present invention comprises a step 1 wherein an electronic program list for multicasters and a program list for multicast listeners are configured based on the multicast channels; a step 2 wherein channels and broadcast times are sold to said multicasters via said electronic program list; a step 3 wherein a broadcast source is acquired from said multicaster; a step 4 wherein said acquired broadcast source is stored after it is subjected to media conversion/encryption and a license is applied; a step 5 wherein said converted medium is automatically transmitted from the storage device to the streaming server; a step 6 wherein a broadcast is made to those multicast listeners who have been granted usage permission by checking whether said multicast listeners have acquired usage permission for the broadcast in question; and a step 7 wherein after the broadcast has been completed, statistical information is collected and transmitted to the multicaster.

In addition, the present invention provides a computer-readable recording medium that records a program for the implementation of a 1st functionality whereby an electronic program list for multicasters and a program list for multicast listeners are configured based on the multicast channels; a 2nd functionality whereby channels and broadcast times are sold to a said multicaster via said electronic program list; a 3rd functionality whereby a broadcast source is acquired from said multicaster; a 4th functionality whereby said acquired broadcast source is stored after it is subjected to media conversion/encryption and a license is applied; a 5th functionality whereby said converted medium is automatically transmitted from the storage device to the streaming server; a 6th functionality whereby a broadcast is made to those multicast listeners who have been granted usage permission by checking whether said multicast listeners have acquired usage permission for the broadcast in question; and a 7th functionality whereby after the broadcast has been completed, statistical information is collected and transmitted to the multicaster.

The aforementioned objective, characteristics and advantages will be further clarified by the attached diagrams and the following detailed explanation. Hereinbelow, a detailed explanation of a preferred embodiment of this invention is provided with reference to the attached diagrams.

Figure 2 is a configuration diagram of one embodiment of the internet multicast channel sales service system of the present invention.

As shown in Figure 2, the internet multicast channel sales service system of the present invention comprises a channel sales system (221) for selling channels; an electronic transaction system (222) for processing payments for the sale of channels by said channel sales system (221); a digital license system (224) for managing licenses for said sold channels; an electronic program guide (226) for informing a multicast listener (240) of which broadcasts are taking place on which channels; an automatic program transmission system (227) for transmitting channel data to a multicast network (230) and managing the broadcast program; a channel management system (228) for generating, deleting, editing and monitoring channels on the multicast network (230) and that is connected to said electronic program guide (220) and said automatic program transmission system (227); a storage system (223) for storing various files; and a statistical system (225) for reporting the viewing status of a multicast listener (240) to the multicaster (210) after viewing has been completed.

Using Figure 3, a somewhat more detailed explanation will now be given regarding the internet multicast channel sales service system of the present invention.

Figure 3 is a detailed configuration diagram of one embodiment of the internet multicast channel sales service system of the present invention.

As seen in Figure 2, the internet multicast channel sales service system of the present invention comprises a channel sales system (221), electronic program guide (226), automatic program transmission system (227), channel management system (228), electronic transaction system (222), storage system (223), digital license system (224), and statistical system (225).

These can be described as follows with reference to Figure 3.

First, the channel sales system (221) comprises in detail a channel information server (312), channel sales server (311), stream posting server (310), and data management server (306).

In one embodiment of the channel information server, as shown in Figure 6 below, when a broadcast time is selected from a purchasable broadcast schedule and "purchase channel" is pressed, the channel sales server (311) is actuated.

The channel sales server (311) sells a channel upon processing of a payment through the electronic transaction system (222). Thus, a multicaster (320) seeking to perform multicast broadcasting can purchase multicast channels in time units such as 15-minute units, or in channel units, from the channel sales server (311). In Figure 7 below, a process has been depicted in which a multicaster (320) purchases a channel from a channel sales server (311).

The stream posting server (hereinafter "channel posting server") (310) is a server that provides functionality for file upload or connection with a relay server. In one embodiment, the information entered in the case of a file upload is as shown in Figure 8 below.

The data management server (306) acts to encrypt the data of said multicaster so as to enable playback only to said multimedia listeners having a license required by the multicaster, and converts data not compatible with the streaming server into data that can be made compatible with the streaming server. The data management server (306) encrypts for playback, and the digital license management system (224), which is part of the logistical support system, manages this; by his means it is possible for the multicaster to sell its own broadcast to the viewer.

An electronic program guide (309) provides appropriate information for each channel to a user seeking to view a channel, via a system for informing the user of which broadcasts are available on which channels. An electronic program guide according to one embodiment is shown in Figure 9 below. For example, if a specific broadcast is pressed on the page for a specific channel/time, information related to the broadcast is obtained. Access is also possible by other means, by searching by defined characteristics of the channel. If the top-level category is "children" and the search is for the second-level category "education", then a list of all broadcasts for this will be provided. Here, when a multicast listener (350) seeks to connect to a channel of the electronic program guide (309), if the broadcast is currently under way, the broadcast is played, and if it is not currently under way, the player, if desired by the multicast listener (350), stores the broadcast information for the broadcast time on the relevant channel, depending on whether it is possible to store channel registration information to a file. The process of actuation, from the perspective of the multicast listener, is as shown in Figure 10 below; here Figure 10 will be described in somewhat greater detail.

The automatic program transmission system (227) comprises a streaming server (308) and a program management server (303).

The streaming server (308) transmits channel data to a multicast network (330) of the ISP; the program management server (303) manages the broadcast schedule, and causes designated advertisements or multicast channel data to be streamed during vacant times.

A channel management system (307) is intended for the creation, deletion, editing and monitoring of channels in the multicast network, and for the purpose of monitoring, is linked to the electronic program guide (309) and the automatic program transmission system (227).

The channel management server (307) exchanges messages and commands with the multicast network (330) in order to generate multicast channels. This section differs for each multicast apparatus; it uses the SNMP standard management protocol based on TCP/IP, and Telnet for remote access.

The logistical support system comprises an electronic transaction server (305), storage system (304), digital license server (302), and statistical server (301).

The electronic transaction server (305) uses a system capable of electronic currency and credit card payments; the storage system (304) can be a network file server, NAS (network attached storage) or SAN (storage area network).

The digital license server (302) comprises a digital rights management system.

The statistical server (301) reports the status to the multicaster (320) after viewing by the multicast listener (350) has been completed.

In addition, the multimedia channel sales service method using the multimedia channel sales service system of the present invention is as follows.

First, the multicasters (320) can be divided between broadcasters connected to a multicast backbone (330) and broadcasters connected to an ordinary internet (340) that lacks multicast functionality.

Multicasters (320) use the channel sales server (311) and electronic program guide (309) of the multicast sales service to purchase the broadcast periods and channels they desire.

Here, either first-come-first-served, auction, or reverse-auction is selected for the channel; channel purchase prices are submitted such that channel purchases within 72 h of the channel broadcast time are made on a first-come-first-served basis, and sales prior to 72 h are made by auction, and the bidder bidding the highest amount for the time in question purchases the broadcast time on the relevant channel. The "reverse-auction method" refers to a technique whereby the multicaster (320) proposes desired prices for channel characteristics (such as bandwidth and broadcast time) in order to multicast its broadcast, and prices are proposed by the ISP for the sale of its channels.

The multicaster (320) who has purchased a broadcast channel selects whether to apply digital licensing to the broadcast during the relevant time, and the broadcast technique.

Digital licensing is determined by whether the broadcast is encrypted; if it is encrypted, then the multicast viewer cannot view it without authentication by the digital license server.

A multicasting broadcaster (320) who has purchased a broadcast channel selects either a file-based technique or a relay technique. In the file-based technique, the multicaster already has a digitized file, and the file is uploaded to the stream posting server (310), and the uploaded file undergoes media conversion and encryption via the data management server (306), after which the stream file is stored in the storage system (304), and at the time of the broadcast, it is automatically transmitted via the streaming server (308). In the relay technique, the multicaster downloads the broadcast transmission program, uploads the broadcast via the stream posting server (310) at the corresponding broadcast time, and this arrives at the data management server (306) in real time; the broadcast is transmitted as a multicast due to the connection of this stream to the streaming server (308) by an automatic transmission program. Here the multicasting

broadcaster (320) can receive inputs from apparatuses including a camera, video, satellite and TV/radio.

A broadcast by the multicaster (320) is sent via the streaming server (308) to the multicast backbone (330); the multicast listener (350) selects a specific multicast channel via the electronic program guide and views the broadcast either free of charge or for a fee depending on the settings of the multicaster (320). If the viewing is free of charge, digital licensing is not applied, and the user can view the multicast broadcast without any limitation. If there is a charge for viewing, the listener can view the multicast broadcast after electronic payment or visiting an advertisement page.

When the multicast listener's (350) viewing has been completed, the viewing time and viewing status are stored in the statistics server (301), and when the broadcast time has ended, it connects with the information of the digital license server (302) to prepare statistics regarding the total number of viewers and viewing quality, and this is then sent to the multicaster (320) by web or e-mail.

Figure 4 is a detailed configuration diagram of one embodiment of the channel sales system of said Figure 2.

As shown in Figure 4, the channel sales system comprises, in detail, a channel information server (401), channel sales server (402), stream (or channel) posting server (403), and data management server (404).

In the channel information server (401), when the broadcast time is selected from a purchasable broadcast schedule and "purchase channel" is pressed, the channel sales server (402) is actuated; the channel sales server (402) sells the channel by processing a payment via the electronic transaction system (222). Thus, a multicaster (320) seeking to perform multicast broadcasting can purchase multicast channels in time units such as 15-minute units, or in channel units, from the channel sales server (402).

The stream posting server (hereinafter "channel posting server") (403) provides file upload or relay server connection functionality; the data management server (404) acts to encrypt the data of said multicaster so as to enable playback only to said multimedia listeners having a license required by the multicaster, and converts data not compatible with the streaming server into data that can be made compatible with the streaming server. The data management server (404) encrypts for playback, and the digital license management system (224), which is part of the rear support system, manages this; by this means, it is made possible for the multicaster to sell its own broadcast to the viewer.

Figure 5 is a detailed configuration diagram of one embodiment of the automatic program transmission system of said Figure 2.

The automatic program transmission system comprises a streaming server (501) and a program management server (502).

The streaming server (501) transmits channel data to the multicast network of the ISP; the program management server (502) manages the broadcast schedule, and causes designated advertisements or multicast channel data to be streamed during vacant times.

Figure 6 is a diagram of one embodiment of the channel information of the channel information server of the present invention.

As shown in Figure 6, when a broadcast time is selected from a purchasable broadcast schedule provided by the channel information server and "purchase channel" is pressed, the channel sales server is actuated.

Figure 7 is a flow chart of an embodiment of the process of actuation of the stream (or channel) posting server of the present invention.

As shown in Figure 7, when the multicaster purchases a channel (702) by entering payment information (701), both file upload (703) and relay server connection (704) become possible.

Figure 8 is an explanatory diagram showing one embodiment of the information that must be entered in order to post a file to the stream (or channel) posting server.

As shown in Figure 8, the information that must be input in order to post a file to said stream (or channel) posting server includes the data type, data format, player URL (Uniform Resource Locator), bandwidth, broadcast time, information related to broadcast content, information related to license management, and information related to statistical processing.

Figure 9 is an explanatory diagram showing one embodiment of the electronic program guide of the present invention.

In the electronic program guide, if a specific broadcast is pressed on the page for a specific channel/time, information related to the broadcast is obtained.

In addition, access is also possible by other means by searching by defined characteristics of the channel. If the top-level category is "children" and the search is for the second-level category "education", then a list of all broadcasts for this will be provided.

Figure 10 is a flow chart of one embodiment of the process of actuation of the electronic program guide of Figure 9, shown from the perspective of a multicast listener.

First, the multicast listener accesses the electronic program guide (1001).

Next, a specific broadcast is selected from the channel or broadcast time (1002), and whether immediate playback is possible is checked (1003).

Based on the result of said check, if immediate playback is possible, it is determined whether a license is needed (1004), and if a license is needed, a broadcast playback license is

purchased (1005) and the broadcast is played (1006). If a license is not needed, then the broadcast is simply played (1006).

If based on the result of said check immediate playback is not possible, it is checked whether storage is possible (1007), and if storage is possible, an automatic receiving program is registered with the schedule program (1008); the time and channel are stored (1009) and after ordering channel playback (1010), if a license is required, the process (1004) of determining whether a license is needed is executed.

If storage is not possible, the process terminates.

Figure 11 is an explanatory diagram of an embodiment of the network configuration for the internet multicast channel sales service of the present invention.

As shown in Figure 11, the network configuration for internet multicast channel sales connects to a multicaster (1110) connected to a multicast backbone (1120), a multicaster (1160) connected to an ordinary internet (1130) that does not support multicasting, a multicast channel sales service system (1140) that sells multicast channels, and a multicast listener (1150) who views multicasted broadcasts.

The network configuration in the case of the sale of channels to a multicast-capable ISP can be divided into two types; these are explained with reference to Figures 12 and 13 below.

Figure 12 is a detailed explanatory diagram of an embodiment of the network configuration for the internet multicast channel sales service of the present invention.

As shown in Figure 12, a multicast channel sales provider (1201) is connected physically to each of ISP-a (1202), ISP-b (1203), and ISP-c (1204), which support multicasting, so as to send broadcast data from a broadcast provider (1205) connected either physically or by internet to a broadcast viewer (1206) connected to the ISPs (1202, 1203, 1204) capable of multicasting. Here, between the broadcast provider (1205) and the broadcast viewer (1206), there is a logical connection, and the multimedia channel sales service provider (1201) acts as a multicast linking network.

Figure 13 is a detailed explanatory diagram of an embodiment of another network configuration for the internet multicast channel sales service of the present invention.

As shown in Figure 13, the network configuration for internet multicast channel sale service involves installation on multicast-capable ISPs (1302, 1303, 1304, 1305) [sic; (1302, 1303, 1304)] and provision of multimedia channel sales service (1306, 1307, 1308) between a broadcast provider (1301) and a broadcast listener (1305) within the ISP (1302, 1303, 1304, 1305). The multicast-capable ISPs (1302, 1303, 1304, 1305) may be combined with other multicast-capable ISPs as needed to provide channel sales service; in this case, the multimedia channel sales service may be configured and operated virtually by a channel sales service provider.

Figure 14 is a flow chart of one embodiment of the internet multicast channel sales service method of the present invention.

As shown in Figure 14, the internet multicast channel sales service method of the present invention first involves the configuration of an electronic program guide based on the multicast channels (1401). Next, the desired channel and broadcast time is sold (1402) by sending the configured electronic program to the multicaster.

Next, the broadcast source (for example, audio, video file, etc.) is received (1403).

Said transmitted broadcast source is subjected to media conversion and encryption (1404) and is stored in the storage system (1405).

Subsequently, the medium stored in the storage system is matched to the channel and broadcast time and automatically transmitted via the streaming server (1406).

In addition, after a viewing request from the multicast listener is received and it is confirmed that said multicast listener has permission to use the broadcast, the broadcast is provided for viewing (1407).

Subsequently, when the broadcast has been completed, statistical information is collected and sent to the multicaster (1408).

This internet multicast channel sales service method of the present invention can be described in somewhat greater detail as follows.

First, the channel and broadcast period desired by the multicaster are purchased by the multicaster using the electronic program guide and channel sales server of the multicast sales service.

Here, either first-come-first-served, auction, or reverse-auction is selected for the channel; channel purchase prices are submitted such that channel purchases within 72 h of the channel broadcast time are made on a first-come-first-served basis, and sales prior to 72 h are made by auction, and the bidder bidding the highest amount for the time in question purchases the broadcast time on the relevant channel. The "reverse-auction method" refers to a technique whereby the multicaster proposes desired prices for channel characteristics (such as bandwidth and broadcast time) in order to multicast its broadcast, and prices are proposed by the ISP for the sale of its channels.

Next, the multicaster who has purchased a broadcast channel selects the broadcast technique and whether a digital license applies to the broadcast during the relevant time. This digital licensing is determined by whether the broadcast is encrypted; if it has been encrypted, then the multicast listener cannot view it without authentication by the digital license server.

Subsequently, the multicaster who has purchased a broadcast channel selects either the file-based technique or the relay technique. In the file-based method, the multicaster already has a digitized file, and the file is uploaded to the stream posting server, and the uploaded file

undergoes media conversion and encryption via the data management server, after which the stream file is stored in the storage system, and at the time of the broadcast, it is automatically transmitted via the streaming server. In the relay technique, the multicaster downloads the broadcast transmission program, uploads the broadcast via the stream posting server at the corresponding broadcast time, and this arrives at the data management server in real time; the broadcast is transmitted as a multicast due to the connection of this stream to the streaming server by an automatic transmission program. Here the multicasting broadcaster can receive inputs from apparatuses including a camera, video, satellite and TV/radio.

The broadcast by the multicaster is sent to the multicast backbone via the streaming server; the multicast listener selects a specific multicast channel via the electronic program guide, and the broadcast is viewed either for a fee or free of charge depending on the settings of the multicaster. If the viewing is free of charge, digital licensing is not applied, and the user can view the multicast broadcast without any limitation. If there is a charge, the listener can view the multicast broadcast after electronic payment or visiting an advertisement page.

When the multicast listener's viewing has been completed, the viewing time and viewing status are stored in the statistics server, and when the broadcast time has ended, it connects with the information of the digital license server to prepare statistics regarding the total number of viewers and viewing quality, and this is then sent to the multicaster by web or e-mail.

As described hereinabove, in the present invention, several multicast broadcast channels are configured by linking multiple internet service providers (ISPs) converted to multicast networks using a multicast apparatus, and an automatic multicast transmission system is configured via these channels; these broadcast channels are purchased electronically by internet broadcasters or individuals using the internet, and these broadcasts can be sold to users seeking to view these broadcasts via the internet.

In other words, a system is established for the automatic transmission of multicast broadcast channels that have already been established, and the automatic transmission system generates an electronic program guide whereby the multicast viewer can select a broadcast, and the multicaster requiring a multicast broadcast channel can select directly via the internet the number of channels, channel type, and time required, and can pay via diverse electronic methods of payment. In addition, during the time in which each channel is vacant, advertisements suited to the characteristics of each channel can be transmitted.

The above-described method of the present invention can be configured programmatically and stored on recording media (CD-ROM, RAM, ROM, floppy disc, hard disc, magneto-optical disc, etc.) in a computer-readable format.

The present invention described above is not limited to the above-described embodiment or the attached diagrams; it will be clear to a person of ordinary skill in the art of the field to

which the present invention pertains that various conversions, alterations and changes are possible without going beyond the technical idea of the present invention.

Effect of the invention

The above-described present invention enables internet broadcasters to easily engage in multicast broadcasting, so that multicasters can create internet broadcasts with both broadcast technology and broadcast content that are more focused and of better quality; a basis is provided for straightforward sale of broadcasts to multicast viewers, so that diverse multicast broadcasts having high quality and high added value are made possible.

In addition, the present invention has the effect of enabling the implementation of multicasting without ISP complaints that have prevented multicasting from becoming widespread due to problems in the inability to create added value due to the absence of multicast billing solutions, and the problems of illegal use and multicast channel management.

In addition, because the present invention enables the creation of electronic sales techniques for multicast channels, it is possible to reduce the amount of foreign currency by enabling internet broadcast without the need to introduce large numbers of broadcast servers for internet broadcasting, thus enabling the overseas sale of this technology; consequently, it will be possible to publicize the developed Korean internet environment overseas.

In addition, the present invention has the effect of spurring development in diverse areas of high-quality, high-value-added internet content such as movies, animation, and internet education, due to the support of digital license technology that renders illegal copying impossible.

In addition, the present invention has the effect of assisting in the management of multicast networks by ISPs, in addition to being very useful in the use of multicast networks by internet broadcasters and individuals seeking to broadcast via the internet, and by this means, has the effect of contributing to the development of domestic networks by enabling profits to be obtained.

Claims

1. An internet multicast channel sales service system comprising an electronic program provision means for the provision of a list of channels being sold and broadcast times to the multicaster and a program of channels and broadcast times to the multicast listener; a channel sales means for the sale of channels and broadcast times to said multicaster and the management of channels that have been sold; a payment processing means for the processing of payments for channel sales in said channel sales means; a license management means for the management of licenses assigned to the channels sold to said multicaster; an automatic program transmission means for the transmission of relevant channel data to a multicast network and management of

the broadcast program; a channel management means for generating, deleting, editing and monitoring channels in a multicast network by connection to said electronic program provision means and said automatic program transmission means; a storage means for storing the files provided by said multicaster; and a statistical means for reporting and managing broadcast statistical information to/for said multicaster after completion of listening by said multicast listener.

2. The multicast channel sales service system recited in Claim 1, wherein said channel sales means is specifically composed of a channel information server, a channel sales server, a stream posting server, and a data management server.

3. The multicast channel sales service system recited in Claim 1, wherein said payment processing means is capable of both electronic currency and credit card payments.

4. The multicast channel sales service system recited in Claim 1, wherein said automatic program transmission means is composed of a streaming server and a program management server, wherein said streaming server transmits channel data to the multicast network of an internet service provider (ISP) and said program management server manages the broadcast schedule, and during the remaining time the manager causes designated advertisements or multicast channel data to be streamed.

5. The multicast channel sales service system recited in Claim 1, wherein said channel management means exchanges messages and commands with the multicast network in order to generate multicast channels and in practice a Telnet protocol is used for remote access together with SNMP (Simple Network Management Protocol), which is a standard management method based on TCP/IP (Transmission Control Protocol/Internet Protocol).

6. The multicast channel sales service system recited in any one of Claims 1-5, wherein at said channel information server, said multicaster causes the desired channel and broadcast time to be selected from among the broadcast schedule and channels available for purchase.

7. The multicast channel sales service system recited in Claim 6, wherein said channel sales server sells channels to said multicaster by processing a payment through said payment processing means, and the multicast channels are sold in time units or channel units.

8. The multicast channel sales service system recited in Claim 6, wherein said stream posting server provides functionality for either uploading files provided by said multicaster, or enables connection to a relay server.

9. The multicast channel sales service system recited in Claim 6, wherein said data management server acts to encrypt the data of said multicaster so as to enable playback only to said multimedia listeners having a license required by the multicaster, and converts data not compatible with the streaming server into data that can be made compatible with the streaming server.

10. An internet multicast channel sales service method comprising a step 1 wherein an electronic program list for multicasters and a program list for multicast listeners are configured based on the multicast channels; a step 2 wherein channels and broadcast times are sold to said multicasters via said electronic program list; a step 3 wherein a broadcast source is acquired from a said multicaster; a step 4 wherein said acquired broadcast source is stored after it is subjected to media conversion/encryption and a license is applied; a step 5 wherein said converted medium is automatically transmitted from the storage device to the streaming server; a step 6 wherein a broadcast is made to those multicast listeners who have been granted usage permission by checking whether said multicast listeners have acquired usage permission for the broadcast in question; and a step 7 wherein after the broadcast has been completed, statistical information is collected and transmitted to the multicaster.

11. The multicast channel sales service method recited in Claim 10, wherein at said step 2, either first-come-first-served, auction, or reverse-auction is selected via the electronic program guide, sales are made on a first-come-first-served basis within a specific date or time period, and sales prior to the specific date or time are made by auction.

12. The multicast channel sales service method recited in Claim 10, wherein the license of said step 4 is determined by whether the relevant broadcast is encrypted, and if it is encrypted, enables listening by the multicast listener to the relevant broadcast only if there is authentication from a digital license server.

13. The multicast channel sales service method recited in Claim 10, wherein at said step 5, the multicaster that has purchased the broadcast channel selects either a file-based or relay technique.

14. The multicast channel sales service method recited in Claim 13, wherein in said file-based technique, the multicaster already has a digitized file, and the file is uploaded to the stream posting server, and the upload file undergoes media conversion and encryption via the data management server, after which the stream file is stored in the storage system, and at the time of the broadcast, it is automatically transmitted via the streaming server.

15. The multicast channel sales service method recited in Claim 13, wherein in said relay technique, the multicaster downloads the broadcast transmission program, uploads the broadcast via the stream posting server at the corresponding broadcast time, and this arrives at the data management server in real time; the broadcast is transmitted as a multicast due to the connection of this stream to the streaming server by an automatic transmission program.

16. The multicast channel sales service method recited in Claim 10, wherein at said step 6, if there is no charge, a digital license is not applied, and said multicast listener can view the multicast broadcast without any limitation; if there is a charge, the listener can view the multicast broadcast after electronic payment or visiting an advertisement page.

17. The multicast channel sales service method recited in Claim 10, wherein at said step 7, when the multicast listener's viewing has been completed, the viewing time and viewing status are stored in the statistics server, and when the broadcast time has ended, it connects with the information of the digital license server to prepare statistics regarding the total number of viewers and viewing quality, and this is then sent to the multicaster by web or e-mail.

18. The multicast channel sales service method recited in any one of Claims 10-17, wherein said multicaster broadcasts upon receiving inputs from a camera, video, satellite, and TV/radio apparatus and the broadcast made by said multicaster is sent to the multicast backbone via the streaming server.

19. The multicast channel sales service method recited in Claim 17, wherein said multicast listener selects a specific multicast channel using said electronic program guide, and views the broadcast, either free of charge or for a fee, based on the settings of the multicaster.

20. A computer-readable recording medium that records a program for the implementation of: a 1st functionality whereby an electronic program list for multicasters and a program list for multicast listeners are configured based on the multicast channels; a 2nd functionality whereby channels and broadcast times are sold to said multicasters via said electronic program list; a 3rd functionality whereby a broadcast source is acquired from a said multicaster; a 4th functionality whereby said acquired broadcast source is stored after it is subjected to media conversion/encryption and a license is applied; a 5th functionality whereby said converted medium is automatically transmitted from the storage device to the streaming server; a 6th functionality whereby a broadcast is made to those multicast listeners who have been granted usage permission by checking whether said multicast listeners have acquired usage permission for the broadcast in question; and a 7th functionality whereby after the broadcast has been completed, statistical information is collected and transmitted to the multicaster.

Drawings

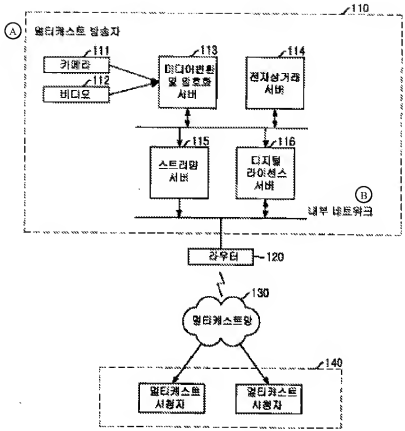

Figure 1

Key:
- A Multicast broadcaster
- B Internal network
- 111 Camera
- 112 Video
- 113 Media conversion and encryption server
- 114 Electronic transaction server
- 115 Streaming server
- 116 Digital license server
- 120 Router
- 130 Multicast network
- 140 Multicast viewer
- Multicast viewer

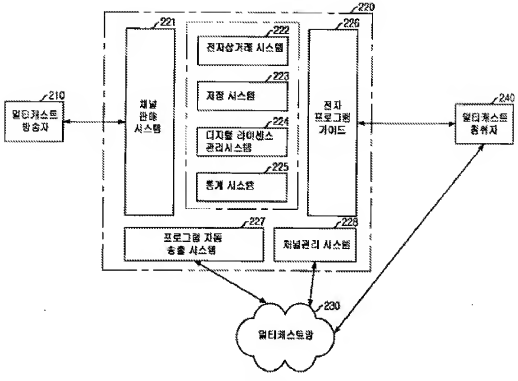

Figure 2

Key:
- 210 Multicaster
- 221 Channel sales service
- 222 Electronic transaction system
- 223 Storage system
- 224 Digital license management system
- 225 Statistical system
- 226 Electronic program guide
- 227 Automatic program transmission system
- 228 Channel management system
- 230 Multicast network
- 240 Multicast listener

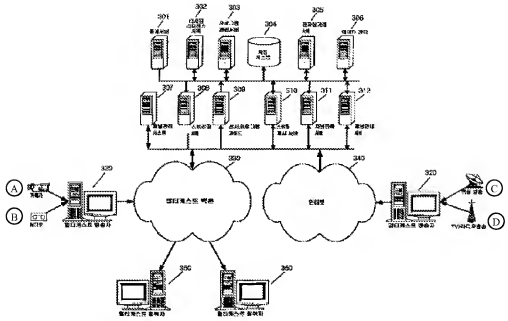

Figure 3

Key:
- A Camera
- B Video
- C Satellite broadcast
- D TV/radio broadcast
- 301 Statistical server
- 302 Digital license server
- 303 Program management server
- 304 Storage system
- 305 Electronic transaction server
- 306 Data management
- 307 Channel management system
- 308 Streaming server
- 309 Electronic program guide
- 310 Stream posting server
- 311 Channel sales server
- 312 Channel information server
- 320 Multicaster
- 330 Multicast backbone
- 340 Internet
- 350 Multicast listener

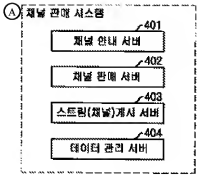

Figure 4

Key: A Channel sales system
401 Channel information system
402 Channel sales system
403 Stream (or channel) posting server
404 Data management server

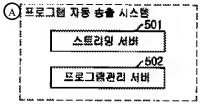

Figure 5

Key: A Automatic program transmission system
501 Streaming server
502 Program management server

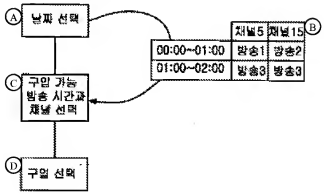

Figure 6

Key: A Date selection
B Channel 5 Channel 15

Broadcast 1 Broadcast 2
Broadcast 3 Broadcast 3

C Purchasable broadcast time and channel selection

D Purchase selection

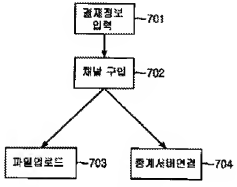

Figure 7

Key: 701 Payment information input
702 Channel purchase
703 File upload
704 Relay server connection

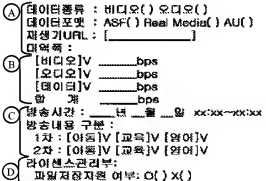

Figure 8

Key: A Data type: video ( ), audio ( )
Data format: ASF ( ) Real Media ( ) AU ( )
Player URL:
Bandwidth:

B [Video]

[Audio]
[Data]
Total

C Broadcast time: year___ month ___ day ___
Broadcast content category:
Primary: [Children] [Education] [English]
Secondary: [Children] [Education] [English]

D License management part:
File storage support Y/N:
Playback number: [1] times
Playback period:
Sales method: Free/Pay-per-view/Contract

E Statistics processing part:
Physical data storage Y/N:

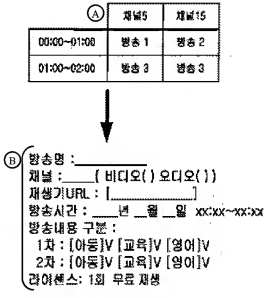

Figure 9

Key: A Channel 5 Channel 15
Broadcast 1 Broadcast 2
Broadcast 3 Broadcast 3

B Broadcast title:
Channel: (Video ( ) Audio ( ))
Player URL:
Broadcast time: year___ month ___ day ___
Broadcast content category:
Primary: [Children] [Education] [English]
Secondary: [Children] [Education] [English]
License: 1x free playback

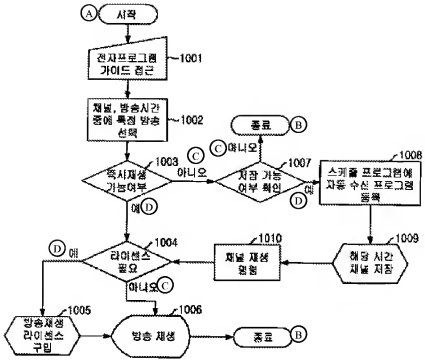

Figure 10

Key:
- A Start
- B End
- C No
- D Yes
- 1001 Access electronic program guide
- 1002 Select specific broadcast from channels and broadcast times
- 1003 Immediate playback possible?
- 1004 License needed?
- 1005 Purchase broadcast playback license
- 1006 Broadcast playback
- 1007 Check whether can save
- 1008 Registration of automatic reception program with schedule program
- 1009 Save time and channel
- 1010 Channel playback order

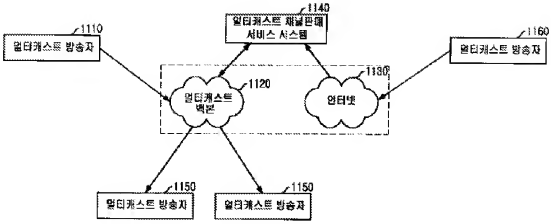

Figure 11

Key: 1110 Multicaster
1120 Multicast backbone
1130 Internet
1140 Multicast channel sales service system
1150 Multicaster
1160 Multicaster

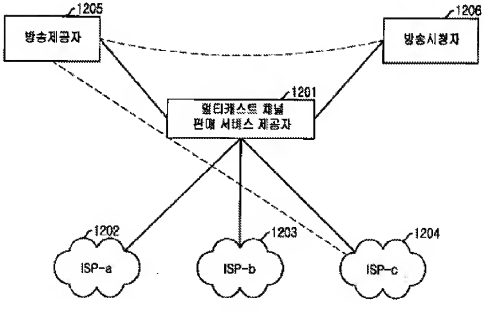

Figure 12

Key: 1201 Multicast channel sales service provider
1205 Broadcast provider
1206 Broadcast viewer

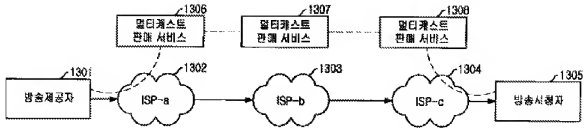

Figure 13

Key: 1301 Broadcast provider
1305 Broadcast viewer
1306 Multicast sales service
1307 Multicast sales service
1308 Multicast sales service

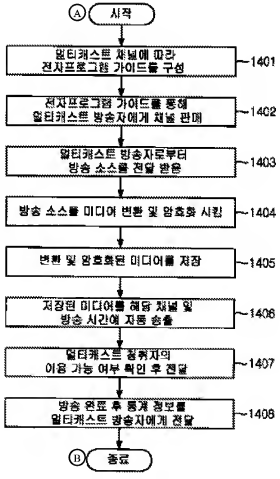

Figure 14

Key:
- A Start
- B End
- 1401 Configuration of electronic program guide based on multicast channel
- 1402 Channel sale to multicaster via electronic program guide
- 1403 Receipt of broadcast source from multicaster
- 1404 Media conversion and encryption of broadcast source
- 1405 Storage of converted and encrypted medium
- 1406 Automatic transmission of saved medium at relevant channel and broadcast time
- 1407 Transmission after checking whether multicast listener can use
- 1408 Transmission of statistical information to multicaster after broadcast has been completed